



SEQUENCE LISTING

(1) GENERAL INFORMATION:

- (i) APPLICANTS: BLUMENFELD, ANAT; GUSELLA, JAMES F;
BREAKEFIELD, XANDRA, O;
SLAUGENHAUPT, SUSAN
- (ii) TITLE OF INVENTION: USE OF GENETIC MARKERS TO
DIAGNOSE FAMILIAL DYSAUTONOMIA
- (iii) NUMBER OF SEQUENCES: 34
- (iv) CORRESPONDENCE ADDRESS:
 - (A) ADDRESSEE: MORGAN & FINNEGAN, L.L.P.
 - (B) STREET: 345 PARK AVENUE
 - (C) CITY: NEW YORK
 - (D) STATE: NEW YORK
 - (E) COUNTRY: USA
 - (F) ZIP: 10154
- (v) COMPUTER READABLE FORM:
 - (A) MEDIUM TYPE: FLOPPY DISK
 - (B) COMPUTER: IBM PC COMPATIBLE
 - (C) OPERATING SYSTEM: PC-DOS/MS-DOS
 - (D) SOFTWARE: ASCII
- (vi) CURRENT APPLICATION DATA:
 - (A) APPLICATION NUMBER: 08/480,655
 - (B) FILING DATE: 07-JUNE-1995
 - (C) CLASSIFICATION:
- (vii) CURRENT APPLICATION DATA:
 - (A) APPLICATION NUMBER: 08/049,678
 - (B) FILING DATE: 16-APRIL-1993
 - (C) CLASSIFICATION:
- (viii) PRIOR APPLICATION DATA:
 - (A) APPLICATION NUMBER: US/07/890,719
 - (B) FILING DATE: 29-MAY-1992
- (ix) ATTORNEY/AGENT INFORMATION:
 - (A) NAME: KENNETH H. SONNENFELD
 - (B) REGISTRATION NUMBER: 33,285
 - (C) REFERENCE/DOCKET NUMBER: 1829-4001US1
- (x) TELECOMMUNICATION INFORMATION:
 - (A) TELEPHONE: 212-451-8513
 - (B) TELEFAX: 212-751-6849

(2) INFORMATION FOR SEQ ID NO: 1:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 20
 - (B) TYPE: NUCLEIC ACID

- (C) STRANDEDNESS: SINGLE
- (D) TOPOLOGY: UNKNOWN
- (ii) MOLECULE TYPE: OLIGONUCLEOTIDE
- (iii) HYPOTHETICAL: No
- (ix) FEATURE:
 - (A) NAME/KEY: PRIMER SEQUENCE OF HXB LOCUS
 - (B) LOCATION: CHROMOSOME 9
 - (C) IDENTIFICATION METHOD:
 - (D) OTHER INFORMATION:
- (x) PUBLICATION INFORMATION:
 - (A) AUTHORS: OZELIUS, L; SCHUBACK, DE;
STEFANSSON, K; SLAUGENHAUPT, S;
GUSELLA, JF; BREAKFIELD, XO
 - (B) TITLE: DINUCLEOTIDE REPEAT POLYMORPHISM
FOR THE HEXABRACHION GENE (HXB) ON
CHROMOSOME 9q32-34
 - (C) JOURNAL: HUMAN MOLECULAR GENETICS
 - (D) VOLUME: 1
 - (E) ISSUE: 2
 - (F) PAGES: 141
 - (G) DATE: 1992
 - (H) DOCUMENT NUMBER:
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 - (J) PUBLICATION DATE:
 - (K) RELEVANT RESIDUES:
- (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 1:

ATAGCCAAAG AGAGGTGCCC

20

(2) INFORMATION FOR SEQ ID NO: 2:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 20
 - (B) TYPE: NUCLEIC ACID
 - (C) STRANDEDNESS: SINGLE
 - (D) TOPOLOGY: UNKNOWN
- (ii) MOLECULE TYPE: OLIGONUCLEOTIDE
- (iii) HYPOTHETICAL: No
- (ix) FEATURE:
 - (A) NAME/KEY: PRIMER SEQUENCE OF HXB LOCUS
 - (B) LOCATION: CHROMOSOME 9
 - (C) IDENTIFICATION METHOD:
 - (D) OTHER INFORMATION:

- (x) PUBLICATION INFORMATION:
- (A) AUTHORS: OZELIUS, L; SCHUBACK, DE;
STEFANSSON, K; SLAUGENHAUPT, S;
GUSELLA, JF; BREAKFIELD, XO
 - (B) TITLE: DINUCLEOTIDE REPEAT POLYMORPHISM FOR
THE HEXABRACHION GENE (HXB) ON CHROMOSOME
9q32-34
 - (C) JOURNAL: HUMAN MOLECULAR GENETICS
 - (D) VOLUME: 1
 - (E) ISSUE: 2
 - (F) PAGES: 141
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 - (K) RELEVANT RESIDUES:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 2:

AGAGCCCTTC TGTCTTTTCC

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(2) INFORMATION FOR SEQ ID NO: 3:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 20
 - (B) TYPE: NUCLEIC ACID
 - (C) STRANDEDNESS: SINGLE
 - (D) TOPOLOGY: UNKNOWN
- (ii) MOLECULE TYPE: OLIGONUCLEOTIDE
- (iii) HYPOTHETICAL: No
- (ix) FEATURE:
- (A) NAME/KEY: PRIMER SEQUENCE OF D9S127 LOCUS
 - (B) LOCATION: CHROMOSOME 9
 - (C) IDENTIFICATION METHOD:
 - (D) OTHER INFORMATION:
- (x) PUBLICATION INFORMATION:
- (A) AUTHORS: LYALL, JEW; FURLONG, RA;
YUILLE, MAR; GOUDIE, DR; LEVERSHA, MA;
AFFARA, NA; FERGUSON-SMITH, MA
 - (B) TITLE: A DINUCLEOTIDE REPEAT POLYMORPHISM
AT THE D9S127 LOCUS
 - (C) JOURNAL: NUCLEIC ACIDS RESEARCH
 - (D) VOLUME: 20
 - (E) ISSUE: 4
 - (F) PAGES: 925
 - (G) DATE: 1992
 - (H) DOCUMENT NUMBER:

- (I) FILING DATE:
- (J) PUBLICATION DATE:
- (K) RELEVANT RESIDUES:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 3:

CCCTCAAAAT TGCTGTCTAT

20

(2) INFORMATION FOR SEQ ID NO: 4:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 23
 - (B) TYPE: NUCLEIC ACID
 - (C) STRANDEDNESS: SINGLE
 - (D) TOPOLOGY: UNKNOWN
- (ii) MOLECULE TYPE: OLIGONUCLEOTIDE
- (iii) HYPOTHETICAL: No
- (ix) FEATURE:
 - (A) NAME/KEY: PRIMER SEQUENCE OF D9S127 LOCUS
 - (B) LOCATION: CHROMOSOME 9
 - (C) IDENTIFICATION METHOD:
 - (D) OTHER INFORMATION:
- (x) PUBLICATION INFORMATION:
 - (A) AUTHORS: LYALL, JEW; FURLONG, RA;
YUILLE, MAR; GOUDIE, DR; LEVERSHA, MA;
AFFARA, NA; FERGUSON-SMITH, MA
 - (B) TITLE: A DINUCLEOTIDE REPEAT POLYMORPHISM
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 - (C) JOURNAL: NUCLEIC ACIDS RESEARCH
 - (D) VOLUME: 20
 - (E) ISSUE: 4
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 - (G) DATE: 1992
 - (H) DOCUMENT NUMBER:
 - (I) FILING DATE:
 - (J) PUBLICATION DATE:
 - (K) RELEVANT RESIDUES:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 4:

AGATTGATTG ATACAAGGAT TTG

23

(2) INFORMATION FOR SEQ ID NO: 5:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 20

- (B) TYPE: NUCLEIC ACID
- (C) STRANDEDNESS: SINGLE
- (D) TOPOLOGY: UNKNOWN

(ii) MOLECULE TYPE: OLIGONUCLEOTIDE

(iii) HYPOTHETICAL: No

(ix) FEATURE:

- (A) NAME/KEY: PRIMER SEQUENCE FOR D9S58 LOCUS
- (B) LOCATION: CHROMOSOME 9
- (C) IDENTIFICATION METHOD:
- (D) OTHER INFORMATION:

(x) PUBLICATION INFORMATION:

- (A) AUTHORS: KWIATKOWSKI, DAVID J;
HENSKE, ELIZABETH P; WEIMER, KIM;
OZELIUS, LAURIE; GUSELLA, JAMES J;
HAINES, JONATHAN
- (B) TITLE: CONSTRUCTION OF A GT POLYMORPHISM
MAP OF HUMAN 9Q
- (C) JOURNAL: GENOMICS
- (D) VOLUME: 12
- (E) ISSUE:
- (F) PAGES: 229-240
- (G) DATE: 1992
- (H) DOCUMENT NUMBER:
- (I) FILING DATE:
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- (K) RELEVANT RESIDUES:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 5:

CCTGAGTAGC CGGGACTATA

20

(2) INFORMATION FOR SEQ ID NO: 6:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 21
- (B) TYPE: NUCLEIC ACID
- (C) STRANDEDNESS: SINGLE
- (D) TOPOLOGY: UNKNOWN

(ii) MOLECULE TYPE: OLIGONUCLEOTIDE

(iii) HYPOTHETICAL: No

(ix) FEATURE:

- (A) NAME/KEY: PRIMER SEQUENCE OF D9S58 LOCUS
- (B) LOCATION: CHROMOSOME 9
- (C) IDENTIFICATION METHOD:

(D) OTHER INFORMATION:

(x) PUBLICATION INFORMATION:

- (A) AUTHORS: KWIATKOWSKI, DAVID J;
HENSKE, ELIZABETH P; WEIMER, KIM;
OZELIUS, LAURIE; GUSELLA, JAMES J;
HAINES, JONATHAN
- (B) TITLE: CONSTRUCTION OF A GT POLYMORPHISM
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- (D) VOLUME:12
- (E) ISSUE:
- (F) PAGES: 229-240
- (G) DATE: 1992
- (H) DOCUMENT NUMBER:
- (I) FILING DATE:
- (J) PUBLICATION DATE:
- (K) RELEVANT RESIDUES:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 6:

TAGGCAACAC ATCAAGATCC T

21

(2) INFORMATION FOR SEQ ID NO: 7:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 20
- (B) TYPE: NUCLEIC ACID
- (C) STRANDEDNESS: SINGLE
- (D) TOPOLOGY: UNKNOWN

(ii) MOLECULE TYPE: OLIGONUCLEOTIDE

(iii) HYPOTHETICAL: No

(ix) FEATURE:

- (A) NAME/KEY: PRIMER SEQUENCE OF D9S59 LOCUS
- (B) LOCATION: CHROMOSOME 9
- (C) IDENTIFICATION METHOD:
- (D) OTHER INFORMATION:

(x) PUBLICATION INFORMATION:

- (A) AUTHORS: KWIATKOWSKI, DAVID J;
HENSKE, ELIZABETH P; WEIMER, KIM;
OZELIUS, LAURIE; GUSELLA, JAMES J;
HAINES, JONATHAN
- (B) TITLE: CONSTRUCTION OF A GT POLYMORPHISM
MAP OF HUMAN 9Q
- (C) JOURNAL: GENOMICS
- (D) VOLUME:12
- (E) ISSUE:
- (F) PAGES: 229-240

- (G) DATE: 1992
- (H) DOCUMENT NUMBER:
- (I) FILING DATE:
- (J) PUBLICATION DATE:
- (K) RELEVANT RESIDUES:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 7:

AAGGGAATTC ATCCCCTGCT

20

(2) INFORMATION FOR SEQ ID NO: 8:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 20
- (B) TYPE: NUCLEIC ACID
- (C) STRANDEDNESS: SINGLE
- (D) TOPOLOGY: UNKNOWN

(ii) MOLECULE TYPE: OLIGONUCLEOTIDE

(iii) HYPOTHETICAL: No

(ix) FEATURE:

- (A) NAME/KEY: PRIMER SEQUENCE OF D9S59 LOCUS
- (B) LOCATION: CHROMOSOME 9
- (C) IDENTIFICATION METHOD:
- (D) OTHER INFORMATION:

(x) PUBLICATION INFORMATION:

- (A) AUTHORS: KWIATKOWSKI, DAVID J;
HENSKE, ELIZABETH P; KIM; OZELIUS, LAURIE;
GUSELLA, JAMES J; HAINES, JONATHAN
- (B) TITLE: CONSTRUCTION OF A GT POLYMORPHISM
MAP OF HUMAN 9Q
- (C) JOURNAL: GENOMICS
- (D) VOLUME: 12
- (E) ISSUE:
- (F) PAGES: 229-240
- (G) DATE: 1992
- (H) DOCUMENT NUMBER:
- (I) FILING DATE:
- (J) PUBLICATION DATE:
- (K) RELEVANT RESIDUES:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 8:

TTACACTATA CCAAGACTCC

20

(2) INFORMATION FOR SEQ ID NO: 9:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 20
 - (B) TYPE: NUCLEIC ACID
 - (C) STRANDEDNESS: SINGLE
 - (D) TOPOLOGY: UNKNOWN
- (ii) MOLECULE TYPE: OLIGONUCLEOTIDE
- (iii) HYPOTHETICAL: No
- (ix) FEATURE:
 - (A) NAME/KEY: PRIMER SEQUENCE OF ASS LOCUS
 - (B) LOCATION: CHROMOSOME 9
 - (C) IDENTIFICATION METHOD:
 - (D) OTHER INFORMATION:
- (x) PUBLICATION INFORMATION:
 - (A) AUTHORS: KWIATKOWSKI, DAVID J;
HENSKE, ELIZABETH P; WEIMER, KIM;
OZELIUS, LAURIE; GUSELLA, JAMES J;
HAINES, JONATHAN
 - (B) TITLE: CONSTRUCTION OF A GT POLYMORPHISM
MAP OF HUMAN 9Q
 - (C) JOURNAL: GENOMICS
 - (D) VOLUME: 12
 - (E) ISSUE:
 - (F) PAGES: 229-240
 - (G) DATE: 1992
 - (H) DOCUMENT NUMBER:
 - (I) FILING DATE:
 - (J) PUBLICATION DATE:
 - (K) RELEVANT RESIDUES:
- (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 9:

GGTTGGCCTA AGAAAACCAT

20

- (2) INFORMATION FOR SEQ ID NO: 10:
 - (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 20
 - (B) TYPE: NUCLEIC ACID
 - (C) STRANDEDNESS: SINGLE
 - (D) TOPOLOGY: *UNKNOWN
 - (ii) MOLECULE TYPE: OLIGONUCLEOTIDE
 - (iii) HYPOTHETICAL: No
 - (ix) FEATURE:
 - (A) NAME/KEY: PRIMER SEQUENCE OF ASS LOCUS

- (B) LOCATION: CHROMOSOME 9
- (C) IDENTIFICATION METHOD:
- (D) OTHER INFORMATION:

(x) PUBLICATION INFORMATION:

- (A) AUTHORS: KWIATKOWSKI, DAVID J;
HENSKE, ELIZABETH P; WEIMER, KIM;
OZELIUS, LAURIE; GUSELLA, JAMES J;
HAINES, JONATHAN
- (B) TITLE: CONSTRUCTION OF A GT POLYMORPHISM
MAP OF HUMAN 9Q
- (C) JOURNAL: GENOMICS
- (D) VOLUME:12
- (E) ISSUE:
- (F) PAGES: 229-240
- (G) DATE: 1992
- (H) DOCUMENT NUMBER:
- (I) FILING DATE:
- (J) PUBLICATION DATE:
- (K) RELEVANT RESIDUES:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 10:

TGGGGAGCTA TAAAAATGAC

20

(2) INFORMATION FOR SEQ ID NO: 11:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 20
- (B) TYPE: NUCLEIC ACID
- (C) STRANDEDNESS: SINGLE
- (D) TOPOLOGY: UNKNOWN

(ii) MOLECULE TYPE: OLIGONUCLEOTIDE

(iii) HYPOTHETICAL: No

(ix) FEATURE:

- (A) NAME/KEY: PRIMER SEQUENCE OF D9S66 LOCUS
- (B) LOCATION: CHROMOSOME 9
- (C) IDENTIFICATION METHOD:
- (D) OTHER INFORMATION:

(x) PUBLICATION INFORMATION:

- (A) AUTHORS: KWIATKOWSKI, DAVID J;
HENSKE, ELIZABETH P; WEIMER, KIM;
OZELIUS, LAURIE; GUSELLA, JAMES J;
HAINES, JONATHAN
- (B) TITLE: CONSTRUCTION OF A GT POLYMORPHISM
MAP OF HUMAN 9Q
- (C) JOURNAL: GENOMICS
- (D) VOLUME:12

- (E) ISSUE:
- (F) PAGES: 229-240
- (G) DATE: 1992
- (H) DOCUMENT NUMBER:
- (I) FILING DATE:
- (J) PUBLICATION DATE:
- (K) RELEVANT RESIDUES:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 11:

CAGACCAGGA ATGCATGAAG

20

(2) INFORMATION FOR SEQ ID NO: 12:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 19
- (B) TYPE: NUCLEIC ACID
- (C) STRANDEDNESS: SINGLE
- (D) TOPOLOGY: UNKNOWN

(ii) MOLECULE TYPE: OLIGONUCLEOTIDE

(iii) HYPOTHETICAL: No

(ix) FEATURE:

- (A) NAME/KEY: PRIMER SEQUENCE OF D9S66 LOCUS
- (B) LOCATION: CHROMOSOME 9
- (C) IDENTIFICATION METHOD:
- (D) OTHER INFORMATION:

(x) PUBLICATION INFORMATION:

- (A) AUTHORS: KWIATKOWSKI, DAVID J;
HENSKE, ELIZABETH P; WEIMER, KIM;
OZELIUS, LAURIE; GUSELLA, JAMES J;
HAINES, JONATHAN
- (B) TITLE: CONSTRUCTION OF A GT POLYMORPHISM
MAP OF HUMAN 9Q
- (C) JOURNAL: GENOMICS
- (D) VOLUME: 12
- (E) ISSUE:
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- (G) DATE: 1992
- (H) DOCUMENT NUMBER:
- (I) FILING DATE:
- (J) PUBLICATION DATE:
- (K) RELEVANT RESIDUES:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 12:

CACGGGCACA CATGTATGC

19

(2) INFORMATION FOR SEQ ID NO: 13:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 20
- (B) TYPE: NUCLEIC ACID
- (C) STRANDEDNESS: SINGLE
- (D) TOPOLOGY: UNKNOWN

(ii) MOLECULE TYPE: OLIGONUCLEOTIDE

(iii) HYPOTHETICAL: No

(ix) FEATURE:

- (A) NAME/KEY: PRIMER SEQUENCE OF D9S15 LOCUS
- (B) LOCATION: CHROMOSOME 9
- (C) IDENTIFICATION METHOD:
- (D) OTHER INFORMATION:

(x) PUBLICATION INFORMATION:

- (A) AUTHORS: KWIATKOWSKI, DAVID J;
HENSKE, ELIZABETH P; WEIMER, KIM;
OZELIUS, LAURIE; GUSELLA, JAMES J;
HAINES, JONATHAN
- (B) TITLE: CONSTRUCTION OF A GT POLYMORPHISM
MAP OF HUMAN 9Q
- (C) JOURNAL: GENOMICS
- (D) VOLUME: 12
- (E) ISSUE:
- (F) PAGES: 229-240
- (G) DATE: 1992
- (H) DOCUMENT NUMBER:
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- (J) PUBLICATION DATE:
- (K) RELEVANT RESIDUES:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 13:

TAAAGATTGG GAGTCAAGTA

20

(2) INFORMATION FOR SEQ ID NO: 14:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 20
- (B) TYPE: NUCLEIC ACID
- (C) STRANDEDNESS: SINGLE
- (D) TOPOLOGY: UNKNOWN

(ii) MOLECULE TYPE: OLIGONUCLEOTIDE

(iii) HYPOTHETICAL: No

- (ix) FEATURE:
- (A) NAME/KEY: PRIMER SEQUENCE OF D9S15 LOCUS
 - (B) LOCATION: CHROMOSOME 9
 - (C) IDENTIFICATION METHOD:
 - (D) OTHER INFORMATION:

- (x) PUBLICATION INFORMATION:
- (A) AUTHORS: KWIATKOWSKI, DAVID J;
HENSKE, ELIZABETH P; WEIMER, KIM;
OZELIUS, LAURIE; GUSELLA, JAMES J;
HAINES, JONATHAN
 - (B) TITLE: CONSTRUCTION OF A GT POLYMORPHISM
MAP OF HUMAN 9Q
 - (C) JOURNAL: GENOMICS
 - (D) VOLUME: 12
 - (E) ISSUE:
 - (F) PAGES: 229-240
 - (G) DATE: 1992
 - (H) DOCUMENT NUMBER:
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 - (J) PUBLICATION DATE:
 - (K) RELEVANT RESIDUES:

- (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 14:

TTCACTTGAT GGTGGTAATC

20

- (2) INFORMATION FOR SEQ ID NO: 15:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 20
 - (B) TYPE: NUCLEIC ACID
 - (C) STRANDEDNESS: SINGLE
 - (D) TOPOLOGY: UNKNOWN

- (ii) MOLECULE TYPE: OLIGONUCLEOTIDE

- (iii) HYPOTHETICAL: No

- (ix) FEATURE:
- (A) NAME/KEY: PRIMER SEQUENCE OF D9S53 LOCUS
 - (B) LOCATION: CHROMOSOME 9
 - (C) IDENTIFICATION METHOD:
 - (D) OTHER INFORMATION:

- (x) PUBLICATION INFORMATION:
- (A) AUTHORS: WILKIE, PJ; KRIZMAN, DB; WEBER; JL
 - (B) TITLE: LINKAGE MAP OF HUMAN CHROMOSOME 9
MICROSATELLITE POLYMORPHISMS
 - (C) JOURNAL: GENOMICS
 - (D) VOLUME: 12

(E) ISSUE:
(F) PAGES: 607-609
(G) DATE: 1992
(H) DOCUMENT NUMBER:
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(J) PUBLICATION DATE:
(K) RELEVANT RESIDUES:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 15:

GCTGCATACT TTAAACTAGC

20

(2) INFORMATION FOR SEQ ID NO: 16:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 22
(B) TYPE: NUCLEIC ACID
(C) STRANDEDNESS: SINGLE
(D) TOPOLOGY: UNKNOWN

(ii) MOLECULE TYPE: OLIGONUCLEOTIDE

(iii) HYPOTHETICAL: No

(ix) FEATURE:

(A) NAME/KEY: PRIMER SEQUENCE OF D9S53 LOCUS
(B) LOCATION: CHROMOSOME 9
(C) IDENTIFICATION METHOD:
(D) OTHER INFORMATION:

(x) PUBLICATION INFORMATION:

(A) AUTHORS: WILKIE, PJ; KRIZMAN, DB; WEBER, JL
(B) TITLE: LINKAGE MAP OF HUMAN CHROMOSOME 9
MICROSATELLITE POLYMORPHISMS
(C) JOURNAL: GENOMICS
(D) VOLUME: 12
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(K) RELEVANT RESIDUES:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 16:

GGAATATGTT TTTATTAGCT TG

22

(2) INFORMATION FOR SEQ ID NO: 17:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 20
 - (B) TYPE: NUCLEIC ACID
 - (C) STRANDEDNESS: SINGLE
 - (D) TOPOLOGY: UNKNOWN
- (ii) MOLECULE TYPE: OLIGONUCLEOTIDE
- (iii) HYPOTHETICAL: No
- (ix) FEATURE:
 - (A) NAME/KEY: PRIMER SEQUENCE OF D9S105 LOCUS
 - (B) LOCATION: CHROMOSOME 9
 - (C) IDENTIFICATION METHOD:
 - (D) OTHER INFORMATION:
- (x) PUBLICATION INFORMATION:
 - (A) AUTHORS: WILKIE, PJ; KRIZMAN, DB; WEBER; JL
 - (B) TITLE: LINKAGE MAP OF HUMAN CHROMOSOME 9
MICROSATELLITE POLYMORPHISMS
 - (C) JOURNAL: GENOMICS
 - (D) VOLUME: 12
 - (E) ISSUE:
 - (F) PAGES: 607-609
 - (G) DATE: 1992
 - (H) DOCUMENT NUMBER:
 - (I) FILING DATE:
 - (J) PUBLICATION DATE:
 - (K) RELEVANT RESIDUES:
- (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 17:

GATCATATTG CTTACAACCC

20

(2) INFORMATION FOR SEQ ID NO: 18:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 21
 - (B) TYPE: NUCLEIC ACID
 - (C) STRANDEDNESS: SINGLE
 - (D) TOPOLOGY: UNKNOWN
- (ii) MOLECULE TYPE: OLIGONUCLEOTIDE
- (iii) HYPOTHETICAL: No
- (ix) FEATURE:
 - (A) NAME/KEY: PRIMER SEQUENCE OF D9S105 LOCUS
 - (B) LOCATION: CHROMOSOME 9
 - (C) IDENTIFICATION METHOD:
 - (D) OTHER INFORMATION:

- (x) PUBLICATION INFORMATION:
- (A) AUTHORS: WILKIE, PJ; KRIZMAN, DB; WEBER, JL
 - (B) TITLE: LINKAGE MAP OF HUMAN CHROMOSOME 9
MICROSATELLITE POLYMORPHISMS
 - (C) JOURNAL: GENOMICS
 - (D) VOLUME: 12
 - (E) ISSUE:
 - (F) PAGES: 607-609
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 - (H) DOCUMENT NUMBER:
 - (I) FILING DATE:
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 - (K) RELEVANT RESIDUES:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 18:

ACTTACTCAT TAAATCTAGG G

21

(2) INFORMATION FOR SEQ ID NO: 19:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 20
 - (B) TYPE: NUCLEIC ACID
 - (C) STRANDEDNESS: SINGLE
 - (D) TOPOLOGY: UNKNOWN

(ii) MOLECULE TYPE: OLIGONUCLEOTIDE

(iii) HYPOTHETICAL: No

(ix) FEATURE:

- (A) NAME/KEY: PRIMER SEQUENCE OF D9S109 LOCUS
- (B) LOCATION: CHROMOSOME 9
- (C) IDENTIFICATION METHOD:
- (D) OTHER INFORMATION:

(x) PUBLICATION INFORMATION:

- (A) AUTHORS: FURLONG, PA; LYALL, JE; GOUDIE, DR; LEVERSHA, MA; AFFARA, NA; FERGUSON-SMITH, MA
- (B) TITLE: A DINUCLEOTIDE REPEAT POLYMORPHISM AT THE D9S109 LOCUS
- (C) JOURNAL: NUCLEIC ACIDS RESEARCH
- (D) VOLUME: 20
- (E) ISSUE:
- (F) PAGES: 925
- (G) DATE: 1992
- (H) DOCUMENT NUMBER:
- (I) FILING DATE:
- (J) PUBLICATION DATE:
- (K) RELEVANT RESIDUES:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 19:

GCACAGGCTG CAATATAGAC

20

(2) INFORMATION FOR SEQ ID NO: 20:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 27
- (B) TYPE: NUCLEIC ACID
- (C) STRANDEDNESS: SINGLE
- (D) TOPOLOGY: UNKNOWN

(ii) MOLECULE TYPE: OLIGONUCLEOTIDE

(iii) HYPOTHETICAL: No

(ix) FEATURE:

- (A) NAME/KEY: PRIMER SEQUENCE OF D9S109 LOCUS
- (B) LOCATION: CHROMOSOME 9
- (C) IDENTIFICATION METHOD:
- (D) OTHER INFORMATION:

(x) PUBLICATION INFORMATION:

- (A) AUTHORS: FURLONG, PA; LYALL, JE; GOUDIE, DR; LEVERSHA, MA; AFFARA, NA; FERGUSON-SMITH, MA
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- (C) JOURNAL: NUCLEIC ACIDS RESEARCH
- (D) VOLUME: 20
- (E) ISSUE:
- (F) PAGES: 925
- (G) DATE: 1992
- (H) DOCUMENT NUMBER:
- (I) FILING DATE:
- (J) PUBLICATION DATE:
- (K) RELEVANT RESIDUES:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 20:

TTTACTGTAT AAAAAGTGA GCTAATA

27

(2) INFORMATION FOR SEQ ID NO: 21:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 22
- (B) TYPE: NUCLEIC ACID
- (C) STRANDEDNESS: SINGLE
- (D) TOPOLOGY: UNKNOWN

(ii) MOLECULE TYPE: OLIGONUCLEOTIDE

(iii) HYPOTHETICAL: No

(ix) FEATURE:

- (A) NAME/KEY: PRIMER SEQUENCE OF D9S106 LOCUS
- (B) LOCATION: CHROMOSOME 9
- (C) IDENTIFICATION METHOD:
- (D) OTHER INFORMATION:

(x) PUBLICATION INFORMATION:

- (A) AUTHORS: WILKIE PJ; KRIZMAN, DB; WEBER; JL
- (B) TITLE: LINKAGE MAP OF HUMAN CHROMOSOME 9
MICROSATELLITE POLYMORPHISMS
- (C) JOURNAL: GENOMICS
- (D) VOLUME: 12
- (E) ISSUE:
- (F) PAGES: 607-609
- (G) DATE: 1992
- (H) DOCUMENT NUMBER:
- (I) FILING DATE:
- (J) PUBLICATION DATE:
- (K) RELEVANT RESIDUES:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 21:

ATTGTGTTGA AATTGACCC CT

22

(2) INFORMATION FOR SEQ ID NO: 22:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 20
- (B) TYPE: NUCLEIC ACID
- (C) STRANDEDNESS: SINGLE
- (D) TOPOLOGY: UNKNOWN

(ii) MOLECULE TYPE: OLIGONUCLEOTIDE

(iii) HYPOTHETICAL: No

(ix) FEATURE:

- (A) NAME/KEY: PRIMER SEQUENCE OF D9S106 LOCUS
- (B) LOCATION: CHROMOSOME 9
- (C) IDENTIFICATION METHOD:
- (D) OTHER INFORMATION:

(x) PUBLICATION INFORMATION:

- (A) AUTHORS: WILKIE, PJ; KRIZMAN, DB; WEBER; JL
- (B) TITLE: LINKAGE MAP OF HUMAN CHROMOSOME 9
MICROSATELLITE POLYMORPHISMS

(C) JOURNAL: GENOMICS
(D) VOLUME: 12
(E) ISSUE:
(F) PAGES: 607-609
(G) DATE: 1992
(H) DOCUMENT NUMBER:
(I) FILING DATE:
(J) PUBLICATION DATE:
(K) RELEVANT RESIDUES:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 22:

CCAGGCTTAT TTCCACACCT

20

(2) INFORMATION FOR SEQ ID NO: 23:

(i) SEQUENCE CHARACTERISTICS:
(A) LENGTH: 20
(B) TYPE: NUCLEIC ACID
(C) STRANDEDNESS: SINGLE
(D) TOPOLOGY: UNKNOWN

(ii) MOLECULE TYPE: OLIGONUCLEOTIDE

(iii) HYPOTHETICAL: No

(ix) FEATURE:
(A) NAME/KEY: PRIMER SEQUENCE OF ABL LOCUS
(B) LOCATION: CHROMOSOME 9
(C) IDENTIFICATION METHOD:
(D) OTHER INFORMATION:

(x) PUBLICATION INFORMATION:
(A) AUTHORS: KWIATKOWSKI, DAVID J; HENSKE,
ELIZABETH P; WEIMER, KIM; OZELIUS, LAURIE;
GUSELLA, JAMES J; HAINES, JONATHAN
(B) TITLE: CONSTRUCTION OF A GT POLYMORPHISM
MAP OF HUMAN 9Q
(C) JOURNAL: GENOMICS
(D) VOLUME:12
(E) ISSUE:
(F) PAGES: 229-240
(G) DATE: 1992
(H) DOCUMENT NUMBER:
(I) FILING DATE:
(J) PUBLICATION DATE:
(K) RELEVANT RESIDUES:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 23:

TTTACACCTT CACCCAGAGA

20

(2) INFORMATION FOR SEQ ID NO: 24:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 20
- (B) TYPE: NUCLEIC ACID
- (C) STRANDEDNESS: SINGLE
- (D) TOPOLOGY: UNKNOWN

(ii) MOLECULE TYPE: OLIGONUCLEOTIDE

(iii) HYPOTHETICAL: No

(ix) FEATURE:

- (A) NAME/KEY: PRIMER SEQUENCE OF ABL LOCUS
- (B) LOCATION: CHROMOSOME 9
- (C) IDENTIFICATION METHOD:
- (D) OTHER INFORMATION:

(x) PUBLICATION INFORMATION:

- (A) AUTHORS: KWIATKOWSKI, DAVID J; HENSKE, ELIZABETH P; WEIMER, KIM; OZELIUS, LAURIE; GUSELLA, JAMES J; HAINES, JONATHAN
- (B) TITLE: CONSTRUCTION OF A GT POLYMORPHISM MAP OF HUMAN 9Q
- (C) JOURNAL: GENOMICS
- (D) VOLUME:12
- (E) ISSUE:
- (F) PAGES: 229-240
- (G) DATE: 1992
- (H) DOCUMENT NUMBER:
- (I) FILING DATE:
- (J) PUBLICATION DATE:
- (K) RELEVANT RESIDUES:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 24:

GGCTGTGTTC AGTTAAACGT

20

(2) INFORMATION FOR SEQ ID NO: 25:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 20
- (B) TYPE: NUCLEIC ACID
- (C) STRANDEDNESS: SINGLE
- (D) TOPOLOGY: UNKNOWN

(ii) MOLECULE TYPE: OLIGONUCLEOTIDE

(iii) HYPOTHETICAL: No

- (ix) FEATURE:
 - (A) NAME/KEY: PRIMER SEQUENCE OF GSN LOCUS
 - (B) LOCATION: CHROMOSOME 9
 - (C) IDENTIFICATION METHOD:
 - (D) OTHER INFORMATION:
- (x) PUBLICATION INFORMATION:
 - (A) AUTHORS: KWIATKOWSKI, DJ; PERMAN, S
 - (B) TITLE: DINUCLEOTIDE REPEAT POLYMORPHISM AT THE GSN LOCUS (9q 32-34)
 - (C) JOURNAL: NUCLEIC ACIDS RESEARCH
 - (D) VOLUME: 19
 - (E) ISSUE:
 - (F) PAGES: 967
 - (G) DATE: 1991
 - (H) DOCUMENT NUMBER:
 - (I) FILING DATE:
 - (J) PUBLICATION DATE:
 - (K) RELEVANT RESIDUES:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 25:

CAGCCAGCTT TGGAGACAAC

20

(2) INFORMATION FOR SEQ ID NO: 26:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 20
 - (B) TYPE: NUCLEIC ACID
 - (C) STRANDEDNESS: SINGLE
 - (D) TOPOLOGY: UNKNOWN
- (ii) MOLECULE TYPE: OLIGONUCLEOTIDE
- (iii) HYPOTHETICAL: No
- (ix) FEATURE:
 - (A) NAME/KEY: PRIMER SEQUENCE OF GSN LOCUS
 - (B) LOCATION: CHROMOSOME 9
 - (C) IDENTIFICATION METHOD:
 - (D) OTHER INFORMATION:
- (x) PUBLICATION INFORMATION:
 - (A) AUTHORS: KWIATKOWSKI, DJ; PERMAN, S
 - (B) TITLE: DINUCLEOTIDE REPEAT POLYMORPHISM AT THE GSN LOCUS (9q 32-34)
 - (C) JOURNAL: NUCLEIC ACIDS RESEARCH
 - (D) VOLUME: 19
 - (E) ISSUE:
 - (F) PAGES: 967

- (G) DATE: 1991
- (H) DOCUMENT NUMBER:
- (I) FILING DATE:
- (J) PUBLICATION DATE:
- (K) RELEVANT RESIDUES:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 26:

TCGCAAGCAT ATGACTGTAA

20

(2) INFORMATION FOR SEQ ID NO: 27:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 18
 - (B) TYPE: NUCLEIC ACID
 - (C) STRANDEDNESS: SINGLE
 - (D) TOPOLOGY: UNKNOWN
- (ii) MOLECULE TYPE: OLIGONUCLEOTIDE
- (iii) HYPOTHETICAL: No
- (ix) FEATURE:
 - (A) NAME/KEY: PRIMER SEQUENCE OF D9S310 LOCUS
 - (B) LOCATION: CHROMOSOME 9
 - (C) IDENTIFICATION METHOD:
 - (D) OTHER INFORMATION:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 27:

GCCTGGGCAA ACAGAGAC

18

(2) INFORMATION FOR SEQ ID NO: 28:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 20
 - (B) TYPE: NUCLEIC ACID
 - (C) STRANDEDNESS: SINGLE
 - (D) TOPOLOGY: UNKNOWN
- (ii) MOLECULE TYPE: OLIGONUCLEOTIDE
- (iii) HYPOTHETICAL: No
- (ix) FEATURE:
 - (A) NAME/KEY: PRIMER SEQUENCE OF D9S310 LOCUS
 - (B) LOCATION: CHROMOSOME 9
 - (C) IDENTIFICATION METHOD:
 - (D) OTHER INFORMATION:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 28:

GCAACTTATT GTTTAACCTG

20

(2) INFORMATION FOR SEQ ID NO: 29:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 19
- (B) TYPE: NUCLEIC ACID
- (C) STRANDEDNESS: SINGLE
- (D) TOPOLOGY: UNKNOWN

(ii) MOLECULE TYPE: OLIGONUCLEOTIDE

(iii) HYPOTHETICAL: No

(ix) FEATURE:

- (A) NAME/KEY: PRIMER SEQUENCE OF D9S309 LOCUS
- (B) LOCATION: CHROMOSOME 9
- (C) IDENTIFICATION METHOD:
- (D) OTHER INFORMATION:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 29:

TAGAGCTCTA CCCCCCAAC

19

(2) INFORMATION FOR SEQ ID NO: 30:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 22
- (B) TYPE: NUCLEIC ACID
- (C) STRANDEDNESS: SINGLE
- (D) TOPOLOGY: UNKNOWN

(ii) MOLECULE TYPE: OLIGONUCLEOTIDE

(iii) HYPOTHETICAL: No

(ix) FEATURE:

- (A) NAME/KEY: PRIMER SEQUENCE OF D9S309 LOCUS
- (B) LOCATION: CHROMOSOME 9
- (C) IDENTIFICATION METHOD:
- (D) OTHER INFORMATION:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 30:

TGAACAGCTA TATATGCCAT CC

22

(2) INFORMATION FOR SEQ ID NO: 31:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 22
- (B) TYPE: NUCLEIC ACID
- (C) STRANDEDNESS: SINGLE
- (D) TOPOLOGY: UNKNOWN

(ii) MOLECULE TYPE: OLIGONUCLEOTIDE

(iii) HYPOTHETICAL: No

(ix) FEATURE:

- (A) NAME/KEY: PRIMER SEQUENCE OF D9S172 LOCUS
- (B) LOCATION: CHROMOSOME 9
- (C) IDENTIFICATION METHOD:
- (D) OTHER INFORMATION:

(x) PUBLICATION INFORMATION:

- (A) AUTHORS: WEISSENBAACH, ET AL.
- (B) TITLE: A SECOND GENERATION LINKAGE MAP OF THE HUMAN GENOME
- (C) JOURNAL: NATURE
- (D) VOLUME: 359
- (E) ISSUE:
- (F) PAGES: 794
- (G) DATE: 1992
- (H) DOCUMENT NUMBER:
- (I) FILING DATE:
- (J) PUBLICATION DATE:
- (K) RELEVANT RESIDUES:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 31:

AACTACAGTG TTCAGTGTGG TG

22

(2) INFORMATION FOR SEQ ID NO: 32:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 20
- (B) TYPE: NUCLEIC ACID
- (C) STRANDEDNESS: SINGLE
- (D) TOPOLOGY: UNKNOWN

(ii) MOLECULE TYPE: OLIGONUCLEOTIDE

(iii) HYPOTHETICAL: No

(ix) FEATURE:

- (A) NAME/KEY: PRIMER SEQUENCE OF D9S172 LOCUS
- (B) LOCATION: CHROMOSOME 9
- (C) IDENTIFICATION METHOD:

(D) OTHER INFORMATION:

(x) PUBLICATION INFORMATION:

- (A) AUTHORS: WEISSENBAACH, ET AL.
- (B) TITLE: A SECOND GENERATION LINKAGE MAP OF THE HUMAN GENOME
- (C) JOURNAL: NATURE
- (D) VOLUME: 359
- (E) ISSUE:
- (F) PAGES: 794
- (G) DATE: 1992
- (H) DOCUMENT NUMBER:
- (I) FILING DATE:
- (J) PUBLICATION DATE:
- (K) RELEVANT RESIDUES:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 32:

ATGGGAATGA GTAGCAAACA

20

(2) INFORMATION FOR SEQ ID NO: 33:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 18
- (B) TYPE: NUCLEIC ACID
- (C) STRANDEDNESS: SINGLE
- (D) TOPOLOGY: UNKNOWN

(ii) MOLECULE TYPE: OLIGONUCLEOTIDE

(iii) HYPOTHETICAL: No

(ix) FEATURE:

- (A) NAME/KEY: PRIMER SEQUENCE OF D9S174 LOCUS
- (B) LOCATION: CHROMOSOME 9
- (C) IDENTIFICATION METHOD:
- (D) OTHER INFORMATION:

(x) PUBLICATION INFORMATION:

- (A) AUTHORS: WEISSENBAACH, ET AL.
- (B) TITLE: A SECOND GENERATION LINKAGE MAP OF THE HUMAN GENOME
- (C) JOURNAL: NATURE
- (D) VOLUME: 359
- (E) ISSUE:
- (F) PAGES: 794
- (G) DATE: 1992
- (H) DOCUMENT NUMBER:
- (I) FILING DATE:
- (J) PUBLICATION DATE:
- (K) RELEVANT RESIDUES:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 33:

TCCAAAGTTC CCCAGGTG

18

(2) INFORMATION FOR SEQ ID NO: 34:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 24
- (B) TYPE: NUCLEIC ACID
- (C) STRANDEDNESS: SINGLE
- (D) TOPOLOGY: UNKNOWN

(ii) MOLECULE TYPE: OLIGONUCLEOTIDE

(iii) HYPOTHETICAL: No

(ix) FEATURE:

- (A) NAME/KEY: PRIMER SEQUENCE OF D9S174 LOCUS
- (B) LOCATION: CHROMOSOME 9
- (C) IDENTIFICATION METHOD:
- (D) OTHER INFORMATION:

(x) PUBLICATION INFORMATION:

- (A) AUTHORS: WEISSENBAACH, ET AL.
- (B) TITLE: A SECOND GENERATION LINKAGE MAP OF THE HUMAN GENOME
- (C) JOURNAL: NATURE
- (D) VOLUME: 359
- (E) ISSUE:
- (F) PAGES: 794
- (G) DATE: 1992
- (H) DOCUMENT NUMBER:
- (I) FILING DATE:
- (J) PUBLICATION DATE:
- (K) RELEVANT RESIDUES:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 34:

GTGTTTAATG ACCCTTGTGG CTAC

24